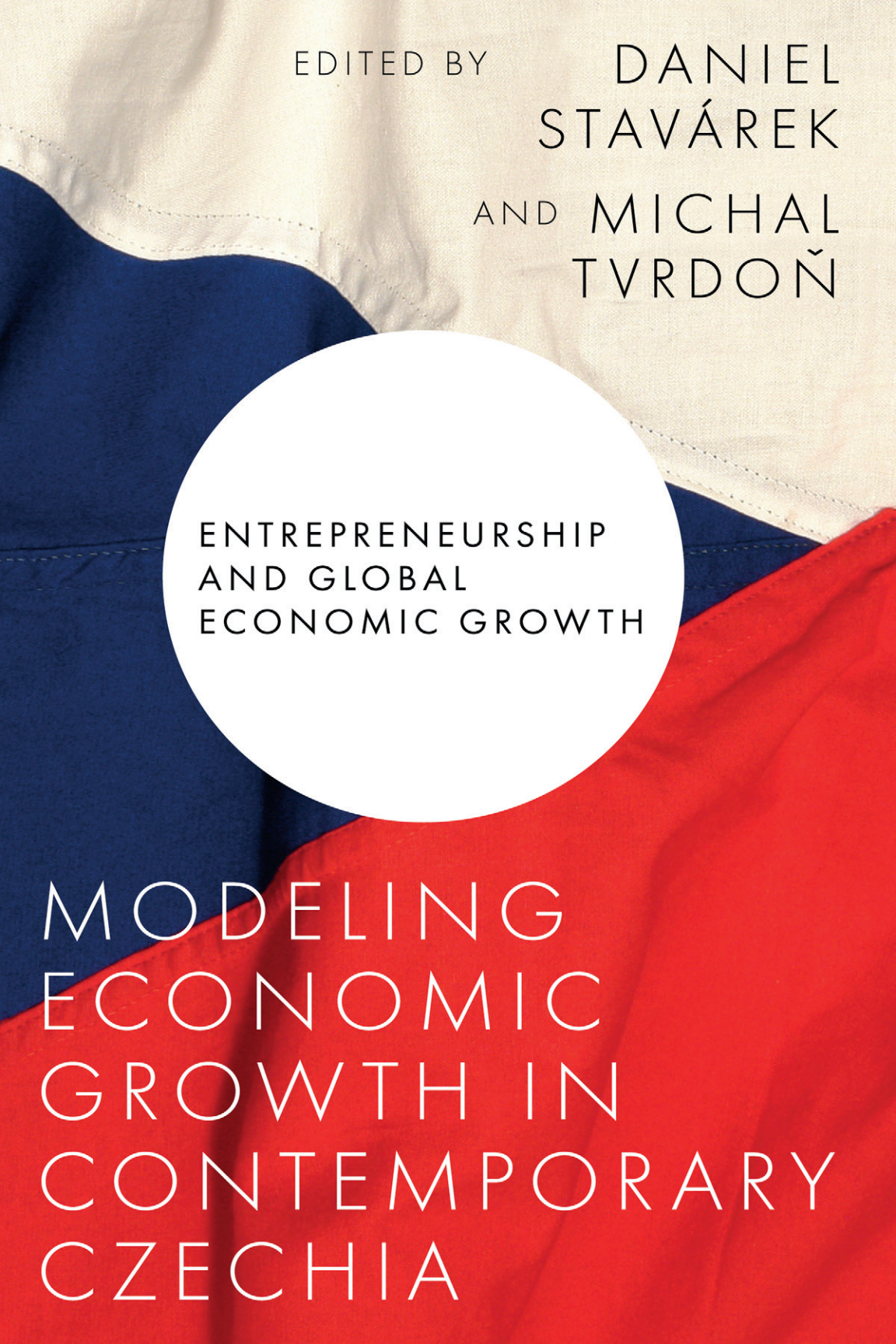
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MODELING ECONOMIC GROWTH IN CONTEMPORARY CZECHIA

Modeling Economic Growth in Contemporary Czechia

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Silesian University in Opava, Czechia

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About the Editors

Daniel Stavárek is a Professor and Head of the Department of Finance and Accounting at the Silesian University in Opava, School of Business Administration in Karviná. His research interest focuses on international finance and banking with a strong emphasis on the process of convergence and European monetary integration. Daniel has published extensively in scholarly journals and authored and edited several books published by renowned international publishers. He currently serves as the Vice Rector for Science and International Relations of the Silesian University in Opava.

Michal Tvrdoň is an Associate Professor at the Department of Economics and Public Administration at the Silesian University in Opava, School of Business Administration in Karviná. As a macroeconomist, his main research fields are related to business cycles, economic integration processes and the labour market. Michal participated in several international and domestic research projects focused on macroeconomic and labour market performance in the countries of the European Union.

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About the Contributors

Liběna Černohorská is an Associate Professor at Faculty of Economics and Administration, University of Pardubice, Czechia. She has written book about banking and two chapters in books related to public–private cooperation and is co-author of two chapters in books *Credit Risk and Financial Crises a Systematic Risk in Post-Crisis Financial Markets*. Her research mainly deals with various issues of banking.

Jan Černohorský is an Associate Professor at Faculty of Economics and Administration, University of Pardubice, Czechia. He has written the book *Finance – From Theory to Reality*, two chapters in books related to public–private cooperation and co-authored the book *Fundamentals of Finance* (all in Czech) and two chapters in book *Credit Risk and Financial Crises*. His research interests focus on macroeconomics and banking.

Petr David is a Professor at the Department of Accounting and Taxes, Faculty of Business and Economics, Mendel University in Brno, Czechia. For many years, he has systematically been working on the issues of externalities, road transport and the related tax policies. He has carried out research projects in this field and cooperated with public sector institutions.

Aleš Franc is an Assistant Professor at Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Czechia. In his publication activities, Aleš focuses on labour market and particularly on labour market institutions, structural changes of employment, the impact of infrastructure on unemployment.

Tomáš Heryán is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored or co-authored numerous papers published in reputable scientific journals, focusing his research on corporate finance, financial markets and monetary policy. He holds certificates from attending several courses on applied statistics using STATA software by Timberlake, London. Hence, as a statistician, he has also participated in medicinal research.

Roman Hlawiczka is an Assistant Professor at the Department of Finance and Accounting at Silesian University in Opava, School of Business Administration in Karviná, Czechia. He has nearly 30 years of experience in management positions in retail banking with a focus on the small and medium-sized enterprise (SME)

and entrepreneur sectors. His research interests have focused on the SME sector. His area of expertise is in the banking sector.

Ladislava Issever Grochová is a Researcher and Instructor in the field of economics at Mendel University in Brno, Czechia. She specializes in environmental economics, macroeconomic and environmental policies, with a focus on the interplay between the economy and the environment addressing institutional context, and productivity and efficiency analysis. She actively involves in a number of international research projects; the outputs being published in scientific journals indexed by the Web of Science and Scopus.

Jana Janoušková is an Associate Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored or co-authored numerous papers published in reputable scientific journals, focusing her research on taxes, tax policy and international tax harmonization.

Vojtěch Koňařík is a doctoral student at the VSB-Technical University in Ostrava, Czechia. His focus includes behavioural economics, altruism and philosophy in economics.

Tetiana Konieva is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored and co-authored several journal articles focused on financing management and corporate finance. Her research activities analyse various aspects of financing policy and cost management.

Ivana Koštuříková is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. Her previous publications in journals focused mainly on various issues of accounting and accounting education. She is currently engaged in research in the field of working capital management.

Eva Kotlánová is an Assistant Professor at the Silesian University in Opava, School of Business Administration in Karviná, Czechia. She is a member of Department of Economics and Public Administration. She focuses on economic policy, institutional environment, corruption and its impact on macroeconomic environment and variables.

Radmila Krkošková is an Assistant Professor at the Department of Informatics and Mathematics at the Silesian University in Opava, School of Business Administration in Karvina, Czechia. She successfully completed her doctoral studies in Applied Mathematics at the University of Ostrava, Faculty of Science. Her scientific research is focused on econometric analysis and analysis of time series.

Zuzana Kučerová is an Associate Professor at the VSB-Technical University in Ostrava and Mendel University in Brno, Czechia. Her research interests include monetary theory and policy, crowdfunding, exchange rates, monetary and financial integration, economic policy and cryptocurrencies.

Marek Litzman is an Assistant Professor at Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Czechia. The main interest of his research is in the impact of formal institutional environment on macroeconomic indicators. He also participated in research in the field of the introduction of EU's Common Consolidated Corporate Tax Base and estimation of its impacts on state budgets.

Aleš Melecký is an Associate Professor and Senior Researcher at the Department of Economics, VSB-Technical University of Ostrava, Czechia. He was Head of the Department of Economics at VSB-TUO during the period 2016–2020. His research topics include macroeconomic modelling, credit risk modelling, government debt management and quantitative literature review.

Radek Náplava is an Assistant Professor at the Department of Economics of Mendel University in Brno in Czechia. His research and publications focus primarily on structural changes in the European labour markets and its socio-economic consequences.

Dennis Nchor received his PhD in Economics and Management in 2016 from Mendel University in Brno, Czechia. He joined the research team of the Department of Economics, Faculty of Business and Economics and has been instrumental in organizing research activities and publishing their outcomes. He has been involved in many collaborative research projects that are financed by renown institutions such as the Internal Grant Agency, European Union and Civil Society Institutions. Dennis is author and co-author of 25 journal papers and conference proceedings that are indexed by the Web of Science and Scopus.

Jan Nevima is an Associate Professor in the field of International Trade and a doctor in the field of Economics at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. His research interest is in econometric and statistical analysis for assessment of competitiveness and convergence. He deals with the issue of smart cities and brownfields.

Daniel Pakši is a doctoral student at the VSB-Technical University in Ostrava, Czechia. His research interests include monetary economics, inflation expectations, housing prices, migration and social exclusion.

Iveta Palečková is an Associate Professor at the Department of Finance and Accounting at Silesian University in Opava, School of Business Administration in Karviná, Czechia. She is the author and co-author of several publications in scientific journals on the stability, performance, efficiency and competition in the banking sector. She was a member of the research team of the projects funded by the Czech Science Foundation.

Lenka Přečková is an Assistant Professor at the Department of Finance and Accounting at Silesian University in Opava, School of Business Administration in Karviná, Czechia. She has authored or co-authored several publications in scientific journals on financial stability, performance and development of the

insurance market. She was a member of the research team of the projects funded by the Czech Science Foundation.

Petr Rozmahel is an Associate Professor in the Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Czechia. Previously, he also led the Research Center of Mendel University. As a macroeconomist, his main research fields are related to business cycles, economic and monetary integration processes and macroeconomic policy. Petr led and participated in many international research projects focused, for example, on the adoption of the euro in Czechia and other Central and Eastern European countries and on processes of macroeconomic convergence in Europe.

Petra Růčková is an Associate Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored or co-authored numerous papers published in reputable scientific journals, focusing her research on corporate finance, financial analysis and capital structure. Petra is a member of the Academic council of School of Business Administration in Karviná and she is also a member of the editorial board of Acta academica Karviniensia.

Jiří Rusnok is a Czech Politician and Economist who served as the Prime Minister of the Czech Republic between June 2013 and January 2014. From 2016 to 2022 he served as the governor of the Czech National Bank. During his time at the helm of the central bank, he received the international awards Central Bank Governor for Central and Eastern Europe 2017 and Central Bank Governor in Europe 2018. He advocated transparent central bank communication, for which the CNB under his leadership was awarded the international Central Banking Transparency Award 2022.

Jana Šimáková is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored or co-authored numerous papers published in reputable scientific journals, focusing her research on exchange rates, foreign trade and international financial management. Jana also lends her expertise as a member of the control and advisory body in the multifunctional coworking center for business support known as Business Gate. Currently, she holds the role of Vice Dean for international relations.

Michal Škára completed his master's degree at Mendel University. Since then, he has been working at the Financial Market Supervision Department II of the Czech National Bank where he contributed to the development and implementation of the reporting framework for financial services intermediaries.

Markéta Skupieňová is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She has authored and co-authored several journal articles focused on managerial and cost accounting. Her current research interests include decision-making processes based on outputs of managerial accounting.

Šárka Sobotovičová is an Assistant Professor at the School of Business Administration in Karvina, Silesian University in Opava, Czechia. She regularly publishes papers in scholarly journals with interest in direct and indirect taxes, national and international tax policy.

Irena Szarowská is an Assistant Professor at the Department of Finance and Accounting of the Silesian University in Opava, School of Business Administration in Karvina, Czechia. She is the author of many articles published in scientific journals included in the Web of Science and Scopus databases. Her scientific interests refer to the field of public finance and fiscal policy as well as municipal and regional finance.

Zuzana Szkorupová is an Assistant Professor at the Department of Finance and Accounting of the Silesian University in Opava, School of Business Administration in Karvina, Czechia. Her research is focused on foreign direct investment and monetary policy.

Petr Teplý is a Professor at Prague University of Economics and Business, Czechia. He has written or co-authored 10 books in the field of banking and finance. His top publications include a *Czech-English Bilingual Book Banking in Theory and Practice*, *Consumer Lending in Theory and Practice* and *Financial Disintermediation: The Case of Peer to Peer Lending*. His research focuses mainly on the area of banking and financial services.

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Foreword

Czechia is a medium-sized country in the middle of Europe. Next year, together with the other new EU Member States, we will mark the 20th anniversary of our accession to the European Union. In 2021, Czechia reached 91% of the EU27 average, measured by GDP per capita in purchasing power parity standards. While this level is higher than Portugal or Spain (75% and 84%, respectively) and close to Italy (95%), Czechia has been growing at the slowest average rate in recent years in almost the entire EU and by far the slowest in the group of Central and Eastern European countries. Between 2005 and 2021, this indicator increased by 63% in Czechia, while it increased by 119% in Poland, 75% in Hungary and 65% in Slovakia. Most recently, between 2021 and 2019, the growth gap is even more pronounced with Czechia +1%, Poland +10%, Hungary +7% and Slovakia +2%. During this period a number of developed Member States (e.g. all Nordic countries, Benelux, Germany, France, Ireland) also grew faster than Czechia.

It is therefore clear that economic convergence towards more advanced countries has stalled. And the Czech economy is losing its ability to catch up, let alone overtake more advanced economies. The medium-term perspective is burdened with a number of complex challenges. Therefore, we must think hard about what the future of the Czech Republic in general and its economy in particular should look like.

This book undeniably comes at the right time and provides us with a lot of inspiration for this thinking. The right therapy in medicine as well as in economic policy cannot be established without a good diagnosis, i.e. an analysis of the state of affairs and the previous developments that have brought us to our current state. In this methodologically correct approach, I find the greatest contribution of this publication. This book provides a professional analysis of many key areas of the economy and the economic policy applied in recent years, using the example of a medium-sized and medium-developed open economy such as Czechia.

The existing model of the Czech economy has been largely based on massive inflows of foreign investment since the second half of the 1990s, which continued de facto throughout the first decade of the current century. This capital has been directed mainly towards industrial capacities, often linked to automobile production. In addition to a long industrial tradition, targeted government support, a favourable geographical location and a well-equipped infrastructure, these investments also found a cheap and high-quality workforce in Czechia.

However, over the last 5–7 years, the situation in Czechia, as well as worldwide, has changed dramatically. The COVID-19 pandemic and the subsequent

disruption of global value chains, as well as the ongoing European energy crisis and Russia's subsequent aggression in Ukraine, symbolise the end of the 'golden' era of globalisation that has shaped world development for the last 30 years.

Labour has long been a scarce commodity in Czechia. We have had the lowest unemployment rate in the EU for a long time, and similarly, the employment rate exceeds 80% and is also well above-average EU standards. The share of foreigners in the labour market is around 15%. The Czech economy is highly energy intensive. Too many companies operate in a subcontracting position so that they do not have the full opportunity to exploit the added value from, for example, research and development and from the sale of their own products. These are perhaps the key structural problems of the Czech economy.

In a certain sense, the Czech economy is facing the challenge of overcoming the so-called middle income trap. That is to say, finding a way to move from the level of a medium-developed EU country to the desirable position of approaching the above-average developed countries. I believe that whether we succeed or not will be determined by how successful Czech society is in making a fundamental qualitative shift in the key areas of our country's governance, which are institutions, innovation and infrastructure.

Economic policy in the narrow sense cannot deliver these priorities. However, its successful management, which in the end means, above all, maintaining the overall macroeconomic balance, is a necessary condition for any positive shift in these priorities. Finding the appropriate monetary and fiscal policy settings appears to be the biggest challenge for the period ahead. This will lead to a sustainable restoration of price and fiscal balance while maintaining adequate growth potential of the Czech economy.

Jiří Rusnok
Governor of Czech National Bank (2016–2022)
Prime Minister of Czechia (2013–2014)

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Chapter 1

The Czech Economy in the Last Decade: Determinants and Obstacles to Economic Growth

Daniel Stavárek and Michal Tvrdoň

Silesian University in Opava, Czechia

Abstract

Czechia is a small open economy and a member state of the European Union. Several important trends and episodes that have determined economic growth can be identified over the last two decades. This chapter deals with some macroeconomic features like macroeconomic and labour market performance within the business cycle, the Czech National Bank (CNB) exchange rate commitment and interest rate policy, increasing indebtedness and budget deficits, foreign trade and the international investment position. We applied publicly available data from Eurostat, the Organisation for Economic Co-operation and Development and CNB databases. The data show that the Czech economy was significantly converging to the average economic level of the European Union. We also identified key turning points in business cycles. Macroeconomic data on economic development of the economy indicate an atypical course of the business cycle between 2020 and 2022, which can be evaluated as different from the one that followed the global financial crisis.

Keywords: Macroeconomic performance; gross domestic product; output gap; unemployment rate; external economic balance; exchange rate; business and consumer surveys

1.1 Introduction

Czechia has been a member state of the European Union (EU) for more than 18 years. During this time, the Czech economy underwent a significant

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transformation. In the past two decades, the Czech economy had to cope with several external and internal shocks, the effects of the global financial crisis and the subsequent crisis of the real economy, the internal recession and subsequent significant economic growth interrupted by the COVID-19 pandemic. The main goal of this chapter is to identify the main macroeconomic trends of the last two decades in the context of the business cycle, the COVID-19 pandemic, disruption of global supply chains and high inflation rates. The last decade brought several situations that disrupted traditional mechanisms of using economic policy instruments to achieve economic growth. We employed key macroeconomic indicators for analysis of the macroeconomic environment, both traditional indicators of a quantitative nature (gross domestic product [GDP], industrial production index [IPI], unemployment rate) and qualitative indicators (economic sentiment indicator [ESI] or the Organisation for Economic Co-operation and Development [OECD] business and consumer confidence indicators). Special attention is also paid to the external economic position as Czechia is an open economy with strong international economic relations. We present development of external balances, the international investment position and exchange rates. We focus on the period between the years 2000 and 2022. We used data from publicly available Eurostat, the Czech National Bank (CNB) and the OECD databases.

1.2 Development of the Key Quantitative Macroeconomic Indicators

The most widely used macroeconomic indicator that represents the general economic activity is the GDP. Fig. 1.1 shows the growth rate of real GDP between the years 2000 and 2022. As can be seen in the figure, the Czech economy recorded two full business cycles, which consist of phases of conjuncture and phases of contraction. In addition, it is clear from the development of the time series that four turning points (two peaks and two troughs) can be identified during this period. If we focus on the significant contractions in 2009 and 2020, these sudden changes were caused by (i) the consequences of the 2008 global financial crisis and (ii) the 2020 COVID-19 pandemic. In the context of the 2009 crisis, Czechia experienced a sharp drop in real GDP growth to negative values. After a period of time, the Czech economy returned to significant economic growth, which is particularly visible between 2016 and 2019. The main contributors to growth were strong domestic demand and exports. Such strong economic growth enabled convergence to the GDP level. On the other hand, it caused a shortage of labour supply, leading to a very low unemployment rate, even below the natural rate of unemployment. Another accompanying feature of rapid growth was the enormous rise in prices in the real estate market. Although there were signs of the economy overheating in 2018 and 2019 that were similar to those of the years 2007 and 2008, the same scenario did not repeat itself. A significant drop in GDP level occurred in 2020 due to the COVID-19 pandemic, which subsequently affected economic development not only in the V4 countries but also

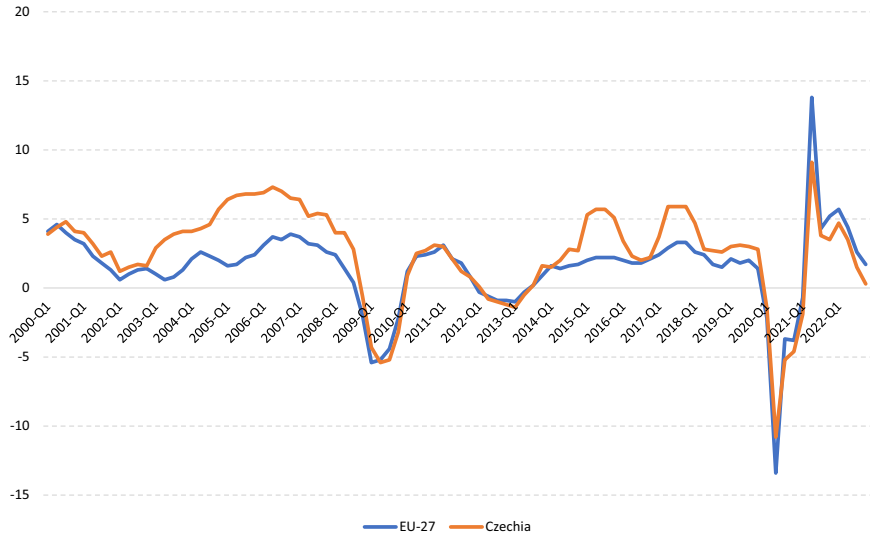

Fig. 1.1. Real GDP Growth in Years 2000–2022 (Quarterly Data, Seasonally and Calendar Adjusted). *Source:* Eurostat.

in the EU and the global economy. The development of real GDP was very volatile during 2020, mainly due to the pandemic situation and the resulting government measures against the spread of the virus. The most prominent measures were the lockdowns applied in the first, second and fourth quarter – these lockdowns led to a decline in household consumption and enterprise investment. The impact on individual sectors of the economy was also different. The following sequence of events can be demonstrated using the example of the Czech economy: (i) there is a noticeable slowdown of the economy in the first quarter of 2020 and a subsequent sharp drop in real GDP level during the second quarter of 2020 (by 10.8% year-on-year); (ii) year-on-year declines in real GDP continued until the first quarter of 2021, with year-on-year changes gradually decreasing; (iii) real GDP growth was recorded from the second quarter of 2021, but with the fact that the base for calculating was the year 2020; and (iv) further developments in the V4 countries indicated inception of a recovery phase after the end of the pandemic; however, the sharp rise in energy and commodity prices reversed this trend during 2022. In addition to this factor, the slower growth of the global economy, the ongoing disruption of global supply chains and greater uncertainty were also influential. These factors, together with weak household demand, led to a remarkable economic slowdown.

During the monitored period, a gradual convergence of the Czech economy to the average economic level (expressed by GDP per capita in PPS) is evident (see Fig. 1.2). However, this convergence process was disrupted during the economic

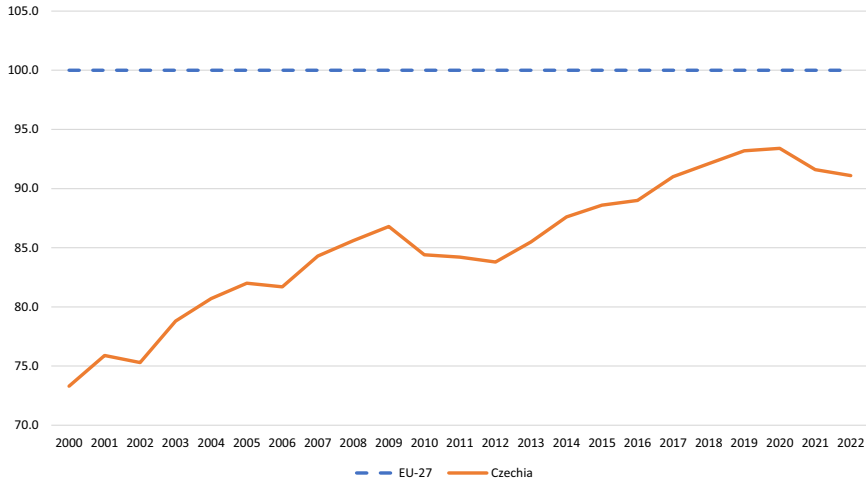

Fig. 1.2. Development of Czech GDP per Capita 2000–2022 (Annual Data, EU-27 = 100). *Source:* Eurostat.

recession (years 2009 and 2010) and subsequently during the internal recession in 2012. The second disruption of this process occurred in the pandemic and post-pandemic period (2020–2022). Overall, the development of the Czech economy can be positively assessed, as there was an increase in the economic level from 73% of the EU-27 average in 2000 to 91% in 2022.

Since there were significant fluctuations in economic development during the observed period, it is also appropriate to focus on the estimation of the output gap. This indicator measures the difference between the estimated potential output and the actual product (real GDP). Subsequently, it can be determined whether demand pressures appear in the economy. If current real GDP is above the level of potential output, then the economy is in an inflationary gap, which means that the prices of goods and services tend to rise, leading to an increase in the price level. Conversely, if current output is below the potential one, then the economy is not fully utilising the factors of production and the economy is in a recessionary gap, or in other words, a negative output gap occurs.

The most common approaches to estimate the output gap include either the method based on the Cobb–Douglas production function or various procedures based on the estimation of trend. We have employed the Hodrick-Prescott filter (HP filter), which is often used for trend estimation. According to Hloušek and Polanský (2007), we applied the time series of real GDP for the potential output estimation (Eurostat's quarterly data between 2000 and 2022). It was also important to determine the value of the smoothing constant λ, which is defined as the ratio variance of the shock causing cyclical fluctuations and the shock affecting trend growth – according to the recommendations in previous studies, it

is appropriate to set the value of the smoothing constant to 1,600 for quarterly data and 100 for annual data (see Gerlach & Yiun, 2004; Hájek & Bezděk, 2001; Němec, 2008; Zimková & Barochovský, 2007). As mentioned above, the only variable needed is real GDP at constant prices (year 2015) and seasonally adjusted.

According to Hájek and Bezděk (2001), the disadvantage of estimating the potential product using the HP filter is the fact that its results are slightly skewed at the beginning and end of the time series, if the beginning and end of the time series do not capture a similar phase of the cycle. Since the key observed period is not located at the beginning and end of the time series, this problem is not a major reason for us not to apply this method.

Fig. 1.3 shows the development of the estimated output gap for the Czech economy between 2000 and 2022. Looking at the development of real GDP and the estimated trend, it can be stated that during the monitored period, the Czech economy reached a significant positive output gap twice (from 2006 to 2007 and from 2017 to 2019).

The disadvantage of GDP is its time lag, and therefore it is used for ex post evaluation of economic development. If we want to describe the current economic situation more accurately or predict future development, it is necessary to use other indicators, usually on a monthly basis. For this purpose, Eurostat created short-term business statistics (STS). In spirit of the above, STS are the first published statistics that show current trends in the economies of the EU. These short-term indicators can be divided into (i) quantitative indicators, which reflect past macroeconomic performance or employment developments, and (ii) qualitative indicators, that is, those that reflect the subjective assessment of the cyclical situation by entrepreneurs or households. Sub-indices measure trends in a time series (e.g. industrial production). The average of the index is equal to 100 for the

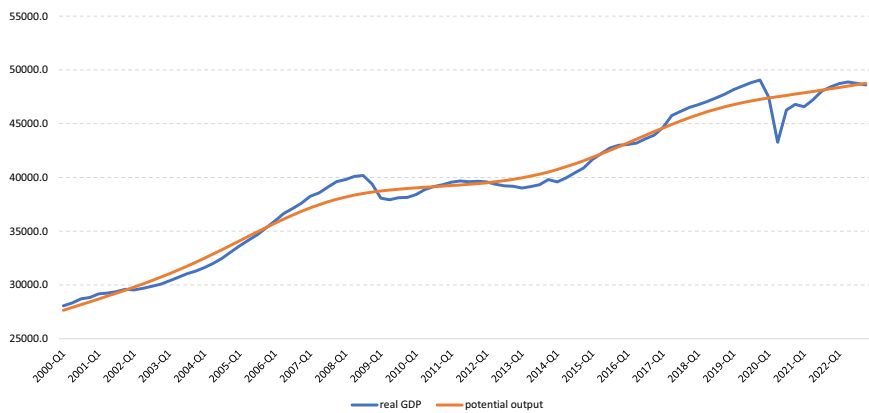

Fig. 1.3. Output Gap in Czechia (Quarterly Data, Seasonally and Calendar Adjusted). *Source:* Eurostat.

base year (usually 2015). Index movements can be expressed in index points (as the difference between two index levels) or as a percentage change. Index points are sensitive to the level of the index itself, whereas percentage changes are not and are therefore suitable for comparison with other variables on a single chart. In addition, it must be added that short-term business statistics do not provide information on the level of prices or turnover, but only information on how prices or turnover have increased or decreased in the previous month, the previous quarter or the previous 12 months.

Fig. 1.4 shows the development of IPI in the manufacturing sector from 2000 to 2022. The manufacturing sector is one of the key sectors of the Czech economy that is strongly pro-export orientated. The figure shows that the manufacturing industry grew quite dynamically in the years preceding the global financial and economic crisis. During the crisis, the manufacturing industry significantly declined, and after a relatively quick recovery during 2010 and 2011, another decline is seen during the years 2012 and 2013 due to internal recession. The precrisis level of IPI in the manufacturing sector was reached in 2014. During the COVID-19 pandemic in 2020, the decline in IPI in the manufacturing sector was sharper compared to the 2009 crisis. On the other hand, it can be stated that the recovery was more dynamic, which resulted from the nature of this shock.

When evaluating the macroeconomic situation, it is important to consider the household sector. Household consumption expenditure accounts for more than half of the GDP measured by the expenditure method in most countries of the EU. Taking into account that households divide their disposable income into two main components, namely consumption and savings, the gross savings rate of households (GSRH) appears as an important indicator in this context. It can be defined as gross saving divided by gross disposable income, with the latter

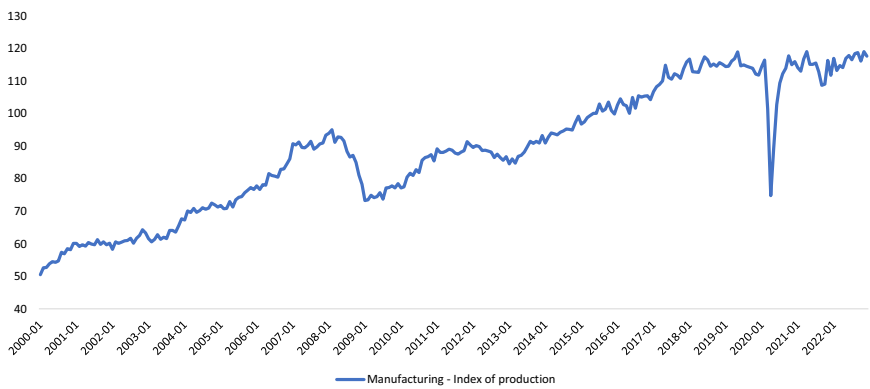

Fig. 1.4. Production in Industry – Manufacturing in Years 2000–2022 (Monthly Data, Seasonally and Calendar Adjusted). *Source:* Eurostat.

adjusted for the change in the net equity of households in pension funds reserves. Gross savings is the part of the gross disposable income, which is not spent as final consumption expenditure. GSRH increases if gross disposable income grows faster than final consumption expenditure. Statistics show that household savings rates increase during periods of increased uncertainty as purchases of essential goods are postponed.

Fig. 1.5 shows the development of household consumption (chain-linked volumes, index 2005 = 100, left axis) and the GSRH (in %, right axis) between 2000 and 2022 (quarterly data). Household consumption increased in the periods of expansion, especially in the years 2005–2008 and 2015–2019. In the case of the global financial crisis and subsequent real economy crisis, household consumption stagnated as a result of the deterioration of consumer confidence in the economy and the growth of the unemployment rate. On the contrary, the decrease in consumption in the second quarter was the result of restrictive measures of governments (lockdown). The specificity of this period also lies in the very rapid recovery of consumption, which reached the pre-COVID level already in the third quarter of 2021. If we look at the development of GSRH, it can be seen from the figure that, while in the case of Czechia, this indicator is relatively stable in the monitored period and varies between 5% and 15%.

Macroeconomic performance subsequently has an impact on another important part of the macroenvironment, namely the labour market performance. In general, the unemployment rate is a key indicator of labour market performance. It increases during a contraction, while it decreases during an expansion. These movements are mainly related to fluctuations in economic activity and the resulting changes in labour demand. The reaction of the labour market to changes in economic activity occurs with a certain time delay, but historical data show

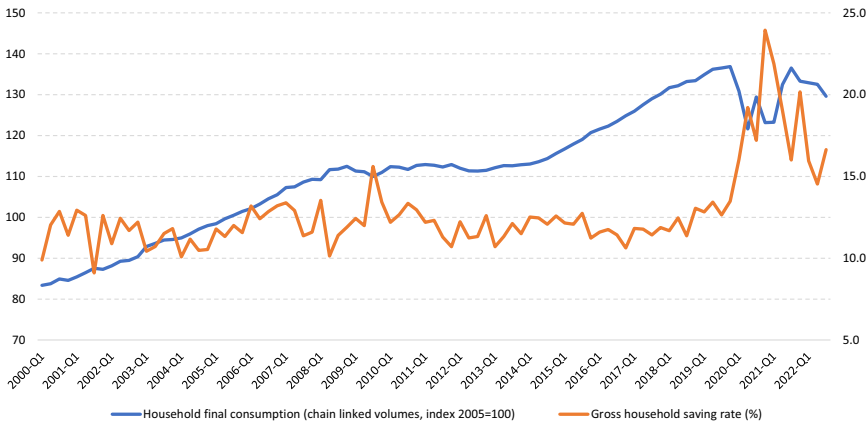

Fig. 1.5. Household Sector (Quarterly Data, Seasonally and Calendar Adjusted). *Source:* Eurostat.

that, while the unemployment rate increases quickly and sharply, its decrease occurs very slowly and over a longer period of time (e.g. the situation before and after the 2008 global financial crisis). In this context, however, it is important to distinguish between the cyclical and structural nature of unemployment. The first is closely related to the development of the business cycle and the second is linked to the structure of the economy and often represents a serious problem, especially from a regional point of view. To analyse the labour market from a macroeconomic point of view, the unemployment rate is the most often used. However, with regard to the above, it is necessary to decompose the unemployment rate into a cyclical and structural component for a more precise assessment of the macroenvironment in the context of the labour market performance. First, it is necessary to seasonally adjust the given time series; then the trend component can be estimated using the HP filter. The difference between the trend thus estimated and the original seasonally adjusted series represents the cyclical component of unemployment (if we reverse the sign). The structural component of unemployment can be determined as the residual part of total unemployment after deducting the seasonal and cyclical components. Fig. 1.6 shows the decomposition of the unemployment rate between the years 2000 and 2022. The figure shows that this important aspect of the overall macroenvironment changed dynamically in Czechia during the monitored period. The initial phase was associated with transition problems that led to higher unemployment rates. As mentioned above, the situation on the labour market is closely related to the overall macroeconomic performance (measured by GDP). In the context of the business cycle, there is an important link between the actual unemployment rate and the natural rate of unemployment. In other words, if the actual unemployment rate is lower than the

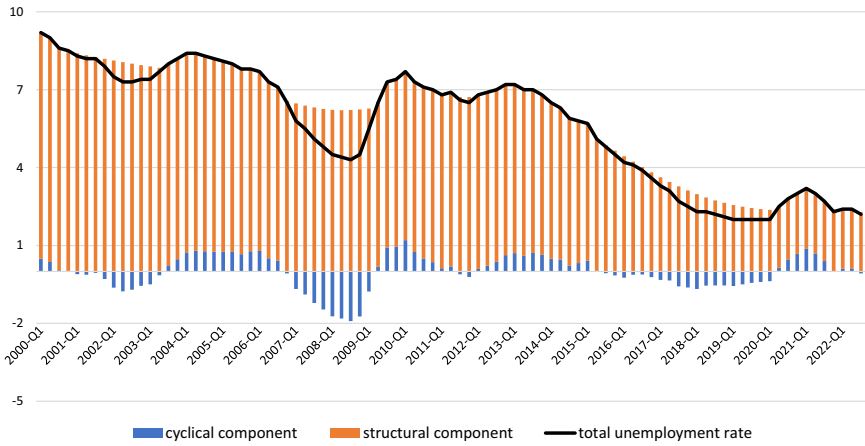

Fig. 1.6. Decomposition of Unemployment (Quarterly Data, Seasonally and Calendar Adjusted). *Source:* Eurostat.